Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] What is claimed is:

1. An anode assembly comprising:

an anode disc;

a first x-ray source connected to the anode disc and configured to emit a first fan beam of x-rays;

a second x-ray source connected to the anode disc and configured to emit a second fan beam of x-rays; and

wherein the first x-ray source has a distance from a center of the anode disc different than that of the second x-ray source.

[c2] 2. The anode assembly of claim 1 wherein the anode disc is rotatable.

[c3] 3. The anode assembly of claim 1 wherein the second fan beam has a spatial coverage equal to that of the first fan beam.

[c4] 4. The anode assembly of claim 1 incorporated into a CT scanner.

[c5] 5. The anode assembly of claim 4 wherein the first and the second x-ray sources are positioned relative to one another on the anode disc such that the first and the

second x-ray sources may be treated as a single focal point for CT reconstruction.

[c6] 6. The anode assembly of claim 4 wherein each x-ray source is configured to operate at an approximate 50% duty cycle per CT scan.

[c7] 7. The anode assembly of claim 1 wherein each fan beam has a penumbra that extends along a z-axis.

[c8] 8. The anode assembly of claim 1 wherein each x-ray source includes a tungsten target track integrally formed in a bevel region of the anode disc.

[c9] 9. An x-ray tube assembly comprising:
a plurality of independently controllable electron sources configured to emit electrons; and
a plurality of target electrodes configured to receive electrons emitted by the plurality of independently controllable electron sources and emit a plurality of fan beams of radiographic energy in response thereto.

[c10] 10. The x-ray tube assembly of claim 9 wherein the plurality of target electrodes is oriented with respect to one another such that each fan beam has a similar spatial coverage.

[c11] 11. The x-ray tube assembly of claim 10 wherein each

fan beam extends along a z-axis.

[c12] 12. The x-ray tube assembly of claim 9 wherein the plurality of electron sources includes a plurality of tungsten targets integrated in a beveled portion of a rotatable anode disc.

[c13] 13. The x-ray tube assembly of claim 9 wherein the plurality of target electrodes includes a pair of target electrodes and wherein each target electrode is configured to emit a respective fan beam of x-rays, each fan beam having a focal spot such that the respective focal spots are spaced apart from one another along a z-direction by approximately one millimeter.

[c14] 14. The x-ray tube assembly of claim 13 wherein the respective focal spots are spatially separated from one another in an x-direction.

[c15] 15. The x-ray tube assembly of claim 9 wherein the plurality of electron sources includes a pair of cathode filaments and wherein the pair of cathode filaments is configured to alternately fire during an imaging scan.

[c16] 16. The x-ray tube assembly of claim 9 incorporated into a CT imaging system.

[c17] 17. The x-ray tube assembly of claim 16 wherein the CT

imaging system includes a medical diagnostic imaging scanner.

[c18] 18. A CT system comprising:
a rotatable gantry having a bore centrally disposed therein;
a table movable fore and aft through the bore and configured to position a subject for CT data acquisition;
a detector array disposed within the rotatable gantry and configured to detect high frequency electromagnetic energy attenuated by the subject;
multiple high frequency electromagnetic energy projection sources positioned within the rotatable gantry and configured to project multiple high frequency electromagnetic energy fan beams toward the subject; and
wherein each projection source is configured to operate at a proportional duty cycle per scan.

[c19] 19. The CT system of claim 18 wherein the multiple high frequency electromagnetic energy projection sources include a first source and a second source and wherein the first and the second source each operate at a 50% duty cycle per scan.

[c20] 20. The CT system of claim 18 wherein the multiple high frequency electromagnetic energy projection sources are configured to project the multiple high frequency elec-

tromagnetic energy fan beams such each fan beam has a similar spatial coverage along a z-direction.

[c21] 21. The CT system of claim 18 wherein the high frequency electromagnetic energy projection sources include a plurality of anodes and a plurality of cathodes, and further comprising a controller configured to sequentially fire each cathode before re-firing a respective cathode.

[c22] 22. The CT system of claim 21 wherein the number of anodes equals the number of cathodes.

[c23] 23. The CT system of claim 18 further comprising a computer programmed to execute an image reconstruction process and wherein the multiple of high frequency electromagnetic energy projection sources are collectively considered a single high frequency electromagnetic energy projection source by the image reconstruction process.

[c24] 24. The CT system of claim 18 configured to non-invasively acquire diagnostic data of a medical patient.